

**ENVIRONMENTAL ASSESSMENT  
U.S. DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT**

**PROPOSED REVISION  
OF THE 1986 SECRETARY'S POTASH ORDER**

**DOI-BLM-NM-P020-2012-0968-EA**

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***I. Introduction***

This document examines the environmental impacts of the Bureau of Land Management's (BLM) proposed revision of the 1986 Secretary of the Interior's Order for Oil, Gas and Potash Leasing and Development within the Designated Potash Area of Eddy and Lea Counties, New Mexico (Order). The Designated Potash Area (DPA) is shown in Figure 1. The proposed revision to the Secretary's Order is primarily an administrative action addressing the concepts designed to promote productive co-development of resources.

Pursuant to 43 CFR 46.210(i), Federal actions that are of an administrative, financial, legal, technical, or procedural nature; or whose environmental effects are too broad, speculative, or conjectural to lend themselves to meaningful analysis and will later be subject to the National Environmental Policy Act (NEPA) process, either collectively or case-by-case, are categorically excluded from the NEPA process under 43 CFR 46.205(b), unless any of the extraordinary circumstances under 43 CFR 46.215 apply. This proposed revision of the potash order does not trigger any of those extraordinary circumstances. Nevertheless, although we have concluded that this action may be categorically excluded under NEPA, the BLM has elected to prepare an Environmental Assessment (EA) in order to aid its decision-making process.

***a) Background and Overview***

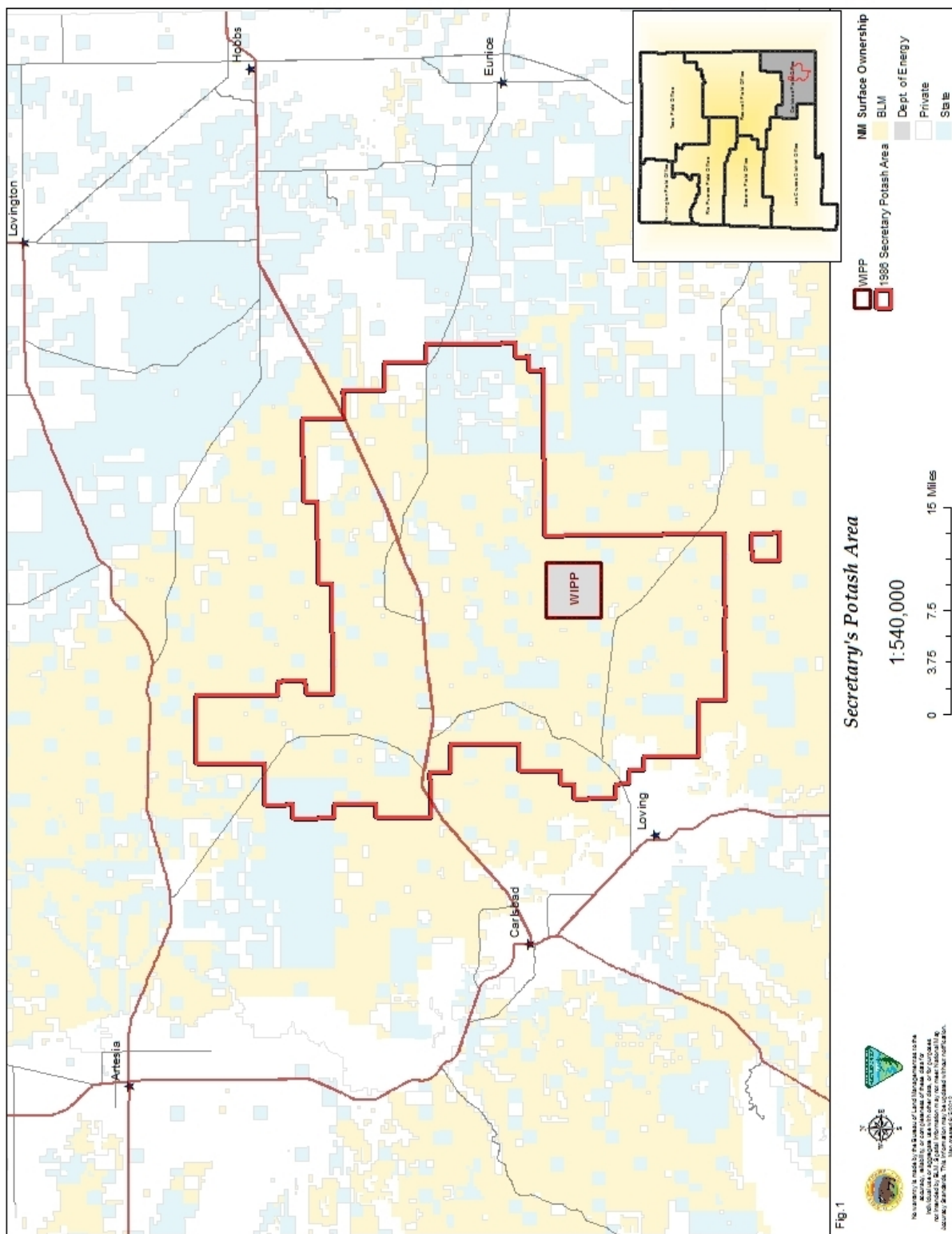
The DPA covers a total area of approximately 497,002 acres and includes 350,617 acres of BLM managed surface where concurrent development of oil and gas and potash occurs. The conflict between the oil and gas and potash industries over development of the mineral resources in the DPA is a result of the area's unique geology supporting all three resources. To achieve concurrent development as first called for in the 1951 Secretary's Order and continuing through

to the most recent 1986 Secretary's Order, the correlative rights of each industry were secured by placing protective stipulations in new leases issued for both oil and gas, and potash. While there has been a long history of litigation of actions within the DPA, concurrent development has occurred in the past as is evidenced by the fact that a total of 4,959 wells (approximately 2,295 active oil wells, 577 active gas wells, 33 water injection wells and the balance in dry holes and abandoned oil and gas wells) are currently located within the DPA. Historically, there have been seven major potash mining operations in the DPA with thousands of miles of underground mine workings. In addition, to date, approximately 2,500 potash core holes have been drilled within the area.

The geologic environments for the deposition of potassium bearing minerals and of oil and gas bearing silts and sands can be very similar and, in the case of the Permian Basin, they are related. This relationship created the deposition of the minerals in tabular deposits, one above the other. The deposition of the potash minerals occurred later in the sequence, thus they are lying above the oil and gas bearing formations. This configuration, with the potash above the oil and gas, has created conflicts between the two industries. In order to produce the lower geologic formations containing oil and gas, it requires drilling through formations that may contain potash deposits. The presence of the well bores, through the potash formations, can be a mechanism or pathway for oil and gas to migrate into the potash formations, creating a safety hazard. The presence of the well bores also causes a loss of recoverable potash ore due to large pillars having to be left around the wells to prevent subsidence from compromising the well bores. The release of oil and gas (through loss of well bore integrity) in sufficient quantities in the underground mining operations could create the potential for the loss of life and property to the potash mining companies and their employees.

The first successful oil well in southeastern New Mexico was drilled in 1924. The conflicts between the potash and oil and gas industries began shortly after the discovery of potash in 1925 (ironically discovered by an oil test well drilled in the basin) and the first potash production in 1934. The first Secretary's Order, issued in 1939 (FR 39-627), withdrew 42,685 acres from oil and gas leasing. The 1939 Order was revoked in 1951 and a new Order was issued (FR Doc. 51-12547), which provided for concurrent operations in the prospecting for and the development and production of oil and gas and potash deposits owned by the United States. This Order was again revised in 1975 and 1986 (FR Doc. 75-29642 and FR Doc. 86-24314, respectively). The 1986 Order had numerous typographical errors which resulted in a set of corrections being issued in 1987 (FR 87-19554).

The management of the two resources through the Secretary's Orders has been contentious throughout the years, resulting in many disputes and court cases. To relieve the tension between industries and to support scientifically-based decisions for management, the BLM contracted for a series of studies to be conducted by an independent scientific organization, the Sandia National Laboratories.



The BLM initiated the first study in July 2007 through a contract with Sandia National Laboratories. The purpose was to “develop a technically sound analysis of potential risks and risk resolutions associated with the concurrent development of both oil and gas and potash production within the Potash Enclave of southeastern New Mexico, with respect to issues of potential gas migration from well bores toward underground potash mines.”

The Sandia National Laboratories report, entitled “Geomechanical Analyses to Investigate Wellbore/Mine Interactions in the Potash Enclave of Southeastern New Mexico,” was completed in August 2009. Criticism of the report from both industries began shortly thereafter. This resulted in representatives of the potash and oil and gas industries forming the Joint Industry Technical Steering Committee early in 2011. The stated objective of the committee is to “establish how both Potash Mining and Oil and Gas Production will operate when their activities are in close proximity so as to allow safe, concurrent development of both minerals.” The name of the committee was later shortened to the Joint Industry Technical Committee (JITC or committee). The proposed revision of the Secretary’s Potash Order of 1986 was initiated by the Secretary of the Interior, Ken Salazar, on January 5, 2012. He asked the JITC to develop mutually agreed upon recommendations on extensive modifications to the Secretarial Order to end the multi-decade conflict between oil and gas and potash interests.

The JITC made several recommendations, which the committee believed would have a significant impact on how orderly concurrent development of oil and gas and potash could be managed within the DPA. Among the key concepts brought forward by the committee was a need for data adequacy to better define areas barren of potash (established through core hole data). Additionally, the committee recommended that Development Areas and Drilling Islands should be established in order to minimize the loss of potash while enabling oil and gas production through current advances in horizontal drilling technology. The committee also recommended the establishment of safety buffers to minimize hazards and allow for orderly development. The JITC further recommended that the BLM exercise its authority to establish unitization in relation to Development Areas in order to ensure orderly development. It also recommended that due diligence stipulations be applied to subsequent potash leasing, and that potash and oil and gas drilling information be shared among the interested parties to ensure that all parties had the same information regarding areas classified as enclave (measured reserves), indicated resources, inferred resources, or barren of potash ore, as such terminology describes the potash content of particular areas within the DPA.

#### ***b) Conformance with Applicable Land Use Plan and Other Environmental Assessments***

The applicable land use plan for this action is the 1988 Carlsbad Resource Management Plan (RMP) and Final Environmental Impact Statement (BLM February 1986) and the Carlsbad RMP Amendment (RMPA) and Final Environmental Impact Statement for Oil and Gas Resources (BLM January 1997), which were approved as the Final RMP and RMPA for the BLM-Carlsbad Field Office (CFO) by the Record of Decisions (ROD), signed September 30, 1988 and October 10, 1997, respectively. The Special Status Species RMPA ROD was signed on May 2, 2008, and amends the RMP and 1997 RMPA. The RMP provided that unless withdrawn from leasing, federal minerals would be open for continued oil and gas development and leasing under Standard Terms and Conditions. It also designated over 2.6 million acres of federal mineral estate (both inside and outside of the DPA) that would be open to potash prospecting, leasing and

development. The RMP and RMPAs also describe specific stipulations that would be attached to new leases offered in certain areas including the DPA. Thus, the RMP and RMPAs permit both oil and gas and potash leasing in the area covered by the DPA. Both alternatives considered in this EA are based on managing leases for oil and gas and potash with at least the minimum conditions contemplated in the RMP, and are therefore consistent with the RMP and subsequent amendments and with the goals and objectives for natural and cultural resources.

Pursuant to 40 Code of Federal Regulations (CFR) 1508.28 and 1502.21, this EA is tiered to and incorporates by reference the information and analysis contained in the RMP and RMPAs and their Final Environmental Impact Statements. At this point, the location and timing for proposing and implementing specific projects in the DPA remain uncertain and speculative. Such projects could include well sites, roads, potash core holes, Development Areas, Drilling Islands, and associated infrastructure. Accordingly, the analysis of projected surface disturbance impacts, should such actions be implemented, would receive individual site and project specific NEPA analysis. While an appropriate focused level of site-specific analysis of individual actions would occur when a lease holder submits an Application for Permit to Drill (APD) or a Drilling Island is established, assumptions based on successful concurrent development will nevertheless be used in the analysis of impacts in this EA.

## ***II. Purpose and Need and Decision to be Made***

The Department of the Interior (Department) is proposing to revise and supersede the Order of the Secretary of the Interior dated October 28, 1986 (51 FR 39425). This revision of the Order would provide updated procedures and guidelines based upon current technological capabilities for more orderly concurrent operations in prospecting for, developing, and producing oil and gas and potash deposits owned by the United States within the DPA and optimize the economic return on these resources for the American public while promoting the safety of underground mining and concentrating surface environmental impacts to specific drilling islands within designated development areas. The decision to be made is whether to revise the Secretary's Potash Order, which would allow for orderly oil and gas drilling while maximizing return and preventing undue waste of potash resources, or to keep the current Secretary's Potash Order.

## ***III. Issues***

The Secretary of the Interior and the BLM have met with representatives from the oil and gas and potash industries, through the JITC, to discuss possible revision of the 1986 Secretary's Potash Order. The JITC was established to identify issues between the two industries and provide input on methods for more efficient and safe co-development of both resources (see Section I.a. – Background & Information for more information on the Committee's technical issues). The Committee also had an opportunity to raise environmental issues, but did not submit any environmental comments.

The revision of the 1986 Secretary's Potash Order was internally scoped and evaluated by the BLM CFO Interdisciplinary Team in June of 2012. A number of potential issues were raised through discussion of the proposed revision and are listed as follows:

How many Development Areas will be created within the DPA and where will the Drilling Islands associated with these Development Areas be located?

How will these Development Areas be located with regard to Special Management Areas, Areas of Critical Environmental Concern, Lesser Prairie-Chicken Habitat Areas and other special designations within the DPA?

How will Drilling Islands be placed so as to minimize impacts to resources such as wildlife, sensitive status species, archaeological sites, recreation, potash mining, and livestock grazing?

What are the potential impacts to grazing carrying capacity and allotment cattle numbers if Drilling Islands are placed in certain range allotments?

What are the potential environmental impacts incident to a possible increase in the number of potash core holes and associated access roads and core hole well pads? Will this lead to an increase in habitat fragmentation, damage to range improvement projects, and invasive weeds within the DPA?

How can Drilling Islands within Development Areas be designed and implemented in light of the lesser prairie-chicken seasonal timing restrictions on drilling and operations?

What are the potential impacts to recreation from more focused drilling activity and an increase in traffic, noise and infrastructure in proximity to the Hackberry Lake Recreation Area?

What are the effects of increased truck traffic incident to more extensive mineral development on air quality, vegetation, wildlife habitat, and livestock grazing? How can the impacts be mitigated? Are there opportunities or a need for centralized produced water injection wells and frac ponds, which are pits that hold water to be used during oil field operations?

The issues identified above are not within the scope of this EA because the impacts associated with them would require site-specific NEPA analysis. The details (location, number of actions, duration of action, design features, etc.) of subsequent actions such as the establishment of Development Areas and Drilling Islands, and the processing of Applications for Permit to Drill (APDs) are not yet known. Thus, the environmental effects of such actions cannot be meaningfully analyzed at this time. While this EA provides some general analysis, specific issues, such as those identified above, will be further analyzed in subsequent NEPA analyses associated with the proposal of Development Areas and Drilling Islands, and the submission of individual APDs and associated infrastructure.

The proposed administrative action should have no impact on human health and safety. Under the current Secretary's Order, gas migration and subsidence are the main factors that could affect mine safety. These same concerns apply on the ground whether or not the current Secretary's Order is revised. Accordingly, there should be no meaningful difference in either of these factors between the proposed action of revising the Secretary's Order and the no action alternative of maintaining the current Order.

#### ***IV. Proposed Action and Alternative***

In this administrative level environmental analysis, the BLM is considering two alternatives: A) continuation of the existing Secretary's Potash Order dated October 28, 1986 (the No Action Alternative), and B) implementation of the proposed revision of the 1986 Secretary's Potash Order.

***Alternative A – Maintain the 1986 Secretary's Potash Order (No Action Alternative)*** - Under this alternative, the BLM would continue to utilize the 1986 Secretary's Potash Order to address the concurrent development of oil and gas and potash resources within the DPA.

The 1986 Secretary's Potash Order addresses concurrent operations in prospecting for, development and production of oil and gas and potash deposits owned by the United States within the Designated Potash Area. The Order provides that a stipulation be attached to all new, readjusted, renewed, reinstated, or extended leases for oil and gas or potash. The purpose of the stipulations attached to an oil and gas lease is to ensure that drilling for oil and gas will not interfere with the mining and recovery of potash deposits, result in undue waste of potash deposits, or constitute a hazard to or unduly interfere with mining operations being conducted for the extraction of potash deposits. Similarly, the purpose of the stipulation attached to a potash lease is to ensure that no mining or exploration operations are conducted that will constitute a hazard to oil and gas production or unreasonably interfere with orderly development and production under any oil and gas lease issued for the same lands.

To help in the management of concurrent operations, the revised Order provides that each potash lessee file annually a map with the areas where active mining operations are currently in progress, areas where mining operations have been completed, areas that are not presently being mined and are considered to contain a mineable resource, areas that are considered to be barren of potash ore, and areas where potash mineralization is unknown.

Under the 1986 Order, the general policy of the Department of the Interior is to deny approval of most APDs for oil and gas test wells from surface locations within the potash enclaves. There are two exceptions to this policy: (1) Drilling of vertical or directional holes is allowed from barren areas within the potash enclaves when the authorized officer determines that such operations will not adversely affect active or planned mining operations in the immediate vicinity of the proposed drillsite, and (2) drilling of vertical or directional holes is permitted from a Drilling Island located within the potash enclave when there are no barren areas within the enclave or drilling is not allowed from the barren area, and when the objective oil and gas formation beneath the lease cannot be reached by a well that is directionally drilled from an approvable location. Drilling Islands are established, consistent with present directional drilling capabilities, in locations which minimize the loss of potash ore and do not constitute a hazard to or unduly interfere with underground mining. No island is established within one mile of any area where approved mining operations will be conducted within three years.

Under the 1986 Order, the agency may require unitization of oil and gas leases in order to protect the equities between oil and gas lessees, while at the same time reducing the number of oil and gas wells in the potash area. The agency currently mandates unitization in those cases where

completion of the proposed well might result in the drainage of oil and gas from beneath other Federal lands within a potash enclave.

The Department cooperates with the New Mexico Oil Conservation Division (NMOCD) in the implementation of that agency's rules and regulations. In that regard, the Order states that a Federal potash lessee continues to have the right to protest to the NMOCD the proposed drilling of an oil and gas test well on Federal Lands.

***Alternative B – Implement New Secretary's Order (Proposed Action)*** - The Department is proposing to revise the 1986 Secretary's Potash Order. The proposed revisions would provide procedures and guidelines for concurrent operations in prospecting for, developing, and producing oil and gas resources without causing undue waste of potash deposits.

The following list identifies, in detail, the new provisions and modifications contained in the proposed revision of the 1986 Secretary's Potash Order:

Implementation of Development Areas and associated Drilling Islands.

Development Areas would be established by the BLM within the DPA in consideration of appropriate current oil and gas drilling technology, such that wells could be drilled from a Drilling Island capable of supporting the effective extraction of oil and gas resources, consistent with management of the impact on potash resources. In most cases, each Development Area would have only one Drilling Island. All new oil and gas drilling that penetrates the potash formations within a Development Area would be performed from its associated Drilling Island or Islands. Wells existing prior to this revision within the boundaries of a Development Area would generally be allowed to produce until abandoned.

Drilling Islands would be areas established by the BLM, usually associated with and within a Development Area, from which all new drilling of vertical, directional or horizontal wells that penetrate the potash formation could be performed to support the development of oil and gas resources from the Development Area.

Maintenance of appropriate Buffer Zones for Potash Mine Workings.

Buffer Zones would be areas established by the BLM within the DPA within which: (1) oil and gas operations would generally not be allowed due to a BLM determination that oil and gas drilling could constitute a hazard to or interfere with orderly potash mining operations, or (2) potash operations would generally not be allowed due to a BLM determination that potash mining or exploration operations could constitute a hazard to or unduly interfere with orderly oil and gas operations. Buffer Zones would be established around open mine workings, Drilling Islands, and operating oil and gas wells. The proposed Order would establish Buffer Zones of ¼ mile for oil wells and ½ mile for gas wells. The BLM could adjust the Buffer Zones in an individual case when doing so would enhance conservation and not compromise safety.

Revision of Buffer Zones would be based on science, engineering and new technology.



#### Unitization and communitization requirements,

To more properly conserve the potash and oil and gas resources in the DPA and to adequately protect the rights of all parties in interest, including the United States, the policy of the Department would be that all oil and gas leases within a Development Area be unitized or be subject to an approved communitization agreement unless there were a compelling reason for operations on a lease basis. The Authorized Officer would make full use of his/her authorities wherever necessary or advisable to require unitization and/or communitization pursuant to the regulations in 43 CFR subparts 3105 and 3180. The BLM would use its discretion to the fullest extent possible to assure that any communitization agreement and any unit plan of operations hereafter approved or prescribed within the DPA would adhere to the provisions of this Order. The BLM would work with Federal lessees, and with the State of New Mexico to include non-Federal mineral rights owners in unit or communitization agreements to protect correlative rights.

#### Coordination with the State of New Mexico,

If the effective operation of any Development Area required that the NMOCD revise the state's mandatory well spacing requirements, the BLM would participate as needed in such a process. The BLM could adopt the NMOCD spacing requirements and require lessees to enter into communitization agreements based on those requirements.

The BLM would cooperate with the NMOCD in the implementation of that agency's rules and regulations.

In taking any action under Section 6.e. of the Order ("Oil and Gas Drilling"), the Authorized Officer would take into consideration the applicable rules and regulations of the NMOCD.

#### Exploration licenses for core hole drilling to establish the location for mineable potash reserves,

An oil and gas or potash operator could apply to BLM for an exploration license to drill core holes necessary to define the existence and extent of mineable potash reserves in areas within the DPA. Costs for such exploration could be shared consistent with the provisions of 43 CFR 3506.14, if applicable. Exploration for potash on lands leased for potash would be permitted only with the written authorization of the potash lessee and the approval by the BLM of an exploration plan in accordance with 43 CFR subpart 3592.

#### Notification of potash lessees during the APD process.

An applicant for an APD, or a proponent of a plan of development for a unit or communitization area or a proposal for a Development Area or a Drilling Island, would provide notice of the application or proposal to the potash lessees and operators in the DPA and the owners of the oil and gas rights and surface owners affected by the application, plan, or proposal. A list of current potash lessees and operators would be available and maintained by the BLM. This notice would be prior to or concurrent with the submission of the application or proposal to the BLM and the BLM would not authorize any action prior to this notice.

## V. *Affected Environment*

The lands within the DPA include a combination of BLM, State, and privately owned surface and mineral estate. Public lands under the management of the BLM within this area reflect the diverse landscape of the Chihuahuan desert. While a majority of the area is characterized by mesquite dunes and shinnery oak vegetative cover known locally as the Mescalero Sands, there are also significant drainages (i.e. Nash Draw); extensive salt lakes and playas (i.e. Laguna Grande); exposed rock outcrops (i.e. the Maroon Cliffs); and numerous ridges, basins and other distinctive topographic features. A total of 34 grazing allotments are located within or partially within the DPA. These allotments are managed and monitored for multiple use and sustained vegetation yield as well as beef production. The DPA includes portions of the habitat for two special status species, the dunes sagebrush lizard (*Sceloporus arenicolus*) and the lesser prairie-chicken (*Tympanuchus pallidicinctus*). Public lands within the DPA contain the shinnery oak-dune environment that provides booming grounds (leks) and nesting habitat for the lesser prairie-chicken as well as the niche dune environment required by the dunes sagebrush lizard. Additionally, there are two archaeological districts currently managed as Special Management Areas (SMA) within the DPA. The Maroon Cliffs SMA contains a rich distribution of formative era archaeological sites, including significant habitation areas located along the ridges, ancient playas, and tributaries of Nash Draw. The Laguna Plata Archaeological District is a unique prehistoric habitation area with significant archaeological deposits located on the margins of a large salt lake.

The 1988 Carlsbad Resource Area RMP is currently being revised. Through the planning process, several existing SMAs and newly identified areas are currently designated as Potential Areas of Critical Environmental Concern (ACECs). These Potential ACECs and other special areas (shown in Figures 2 and 3) have been designated based upon the criteria described in the following table:

<b><i>Identified Area</i></b>	<b><i>Relevant &amp; Important Criteria / Resource</i></b>
Maroon Cliffs Potential ACEC (managed as a SMA under the current RMP)	Cultural Resource Values
Laguna Plata Archaeological District and Potential ACEC (managed as a SMA under the current RMP)	Cultural Resource and Wildlife Values
Desert Heronries Potential ACEC	Wildlife Values
Salt Playas Potential ACEC	Cultural Resource and Wildlife Values
Cave Resources Potential ACEC	Wildlife, Natural System/Processes Values and Natural Hazards
Hackberry Lake OHV Recreation Area (managed as a SMA under the current RMP)	Recreation Issues
Lesser Prairie-Chicken Habitat Areas	Special Status Species Habitat and Wildlife Values
The Gnome Site	Withdrawn from Mineral Leasing by Department of Energy
The Waste Isolation Pilot Project (WIPP)	Withdrawn from Mineral Leasing by Department

Site)	of Energy
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Remaining BLM lands within the DPA are managed for a variety of resource values and uses such as, but not limited to, recreation, potash mining, livestock grazing, rights-of-way, and oil and gas development.

### ***Socioeconomics***

The DPA is located within Eddy and Lea Counties, which comprise the primary study area for socioeconomic effects of the proposed action and alternatives. These counties provide the public services and the majority of the workforce for both oil and gas and potash development in the DPA. While mining and oil and gas production constitute only 2.4% of the total workforce in New Mexico, these two industries account for 16.8% of the employment in Eddy County and 15.5% of the employment in Lea County. Mosaic Potash employs approximately 470 people locally while Intrepid Potash currently has 629 local employees, with an additional 260 construction jobs and a projected increase of 36 permanent positions associated with the HB solution mine project. The oil and gas industry directly employs approximately 5,400 people locally (Eddy and Lea counties). Some of the locally based oil and gas employers in the region (for example, Yates Petroleum and Mack Energy) are cornerstones of their communities as well as important local employers. Many larger international and regional oil and gas operators also have a significant local presence and are major employers for the area. These considerable employment figures do not include the full complement of service companies and subcontractors in the region that have been created specifically to support both the oil and gas and potash industries (Headwaters Economics 2012).

While the local economy is clearly dependent on both industries, their activities also contribute greatly to the state and national economy. New Mexico contributes over 3% of the annual domestic crude oil output total. In 2011, the oil and gas industry statewide contributed over \$2 billion in direct revenue and another \$300 million in indirect income to the state of New Mexico. Most years, oil and gas revenue makes up approximately 15% of the state's total general fund revenue (New Mexico Legislative Finance Committee statistics). In 2011, approximately \$477 million in federal oil and gas royalties came from operations in the CFO area (ONRR statistics). The potash industry contributed approximately \$18 million in federal royalties in 2011 (ONRR statistics).

While the importance of oil and gas to our nation's economy is generally well known, it should be noted that potash (as a source of fertilizer) is also a very important domestic and worldwide commodity. According to the U.S. Geological Survey, world potash consumption is projected to increase by approximately 4% annually over the next five years in response to world population growth and the concurrent need for increased production of food and biofuel. The majority of domestic potash production (more than 75% of the U.S. total production) comes from the DPA in southeastern New Mexico. While there is significant potash production in other parts of the world (i.e., Canada, Russia, Belarus, Germany and other countries), the potash deposits in southeastern New Mexico are made even more important due to the fact that the United States is the world's second largest consumer of potash.

Under the 1986 Secretary's Potash Order, oil and gas development within the DPA has been restricted. Inaccessible leases within the enclave are suspended or have been unitized and held by production when leases are constrained by proximity to open mine workings or known potash reserves. New Mexico Tech's Petroleum Recovery Research Center performed a study of the area entitled "Oil and Gas Potential Analysis of the Secretary of Interior's Potash Area, Southeastern New Mexico" in 2009. This analysis estimated untapped oil and gas resources of existing plays in the area at 1.4 billion BOE (Barrels Oil Equivalent), or 468 million barrels of oil and 5TCF of gas. Secondary recovery potential was estimated to provide an additional 318 million barrels of oil. The economic valuation of these resources varies based upon the price of oil but was estimated at a value between \$40 - \$86 billion for primary recovery and an additional \$16 - \$32 billion for secondary oil recovery. The royalty potential for these resources was estimated at \$7.5 - \$15.8 billion in royalties for the state of New Mexico and an additional \$2.5 - \$5.2 billion in federal royalties. Likewise, the local potash production in 2007 had a market value of approximately \$270 million and this is just a small fraction of the historic potash recovered from the basin as well as the potential potash resource within the DPA. The significant economic potential of both resources and the importance of finding a method of concurrent development has been the impetus for revision of the 1986 Secretary's Potash Order.

Additional descriptions of the affected environment and analysis of the effects oil and gas and potash operations may have on the human environment can be found in the 1988 Carlsbad Resource Area RMP, as amended by the 1997 Carlsbad Resource Area RMPA and the 2008 Pecos District Special Status Species RMPA.

## ***VI. Environmental Effects***

The following analysis evaluates the environmental effects to the human environment that may occur as a result of revisions to the 1986 Secretary's Potash Order.

### ***Assumptions Made as Part of the Impact Analysis***

The proposed action and alternative are very limited in scope. The new concepts proposed under the revision of the 1986 Secretary's Potash Order are administrative in nature. While the general concepts, such as Development Areas, Drilling Islands and core hole locations, would be established by the revised Order, the implementation of those concepts on the ground, specific locations, and their relationship to on-the-ground resources would need to be evaluated through subsequent site-specific NEPA analysis. Attempts to analyze such site-specific impacts at this time would be merely speculative.

The revision of the 1986 Secretary's Potash Order might result in a net increase in oil and gas development within the DPA. By providing a framework for more productive concurrent development, there might ultimately be more oil and gas development than would occur under the current 1986 Secretary's Potash Order. Much of the related surface disturbance might be concentrated in a certain number of yet to be determined Development Areas. In addition, a focus on extensive core hole drilling as a means of establishing the location of mineable potash resources might increase surface disturbance and habitat fragmentation.

Alternatively, unitization and coordination on activities taking place on the lands might reduce the overall amount of surface disturbance when compared to what would take place under the current 1986 Secretary's Potash Order. The resulting Development Areas might provide opportunities for centralized storage facilities, frac ponds, and water disposal wells, and less infrastructure overall. However, it is unknown how much surface disturbance would result from Development Areas, Drilling Islands and associated APDs that might be approved under the revised Order until actual on-the-ground proposals to implement those concepts are made. Thus, the number, size, location and implementation of Development Areas within the DPA is currently unknown and meaningful analysis of any potential environmental impacts must await site-specific proposals.

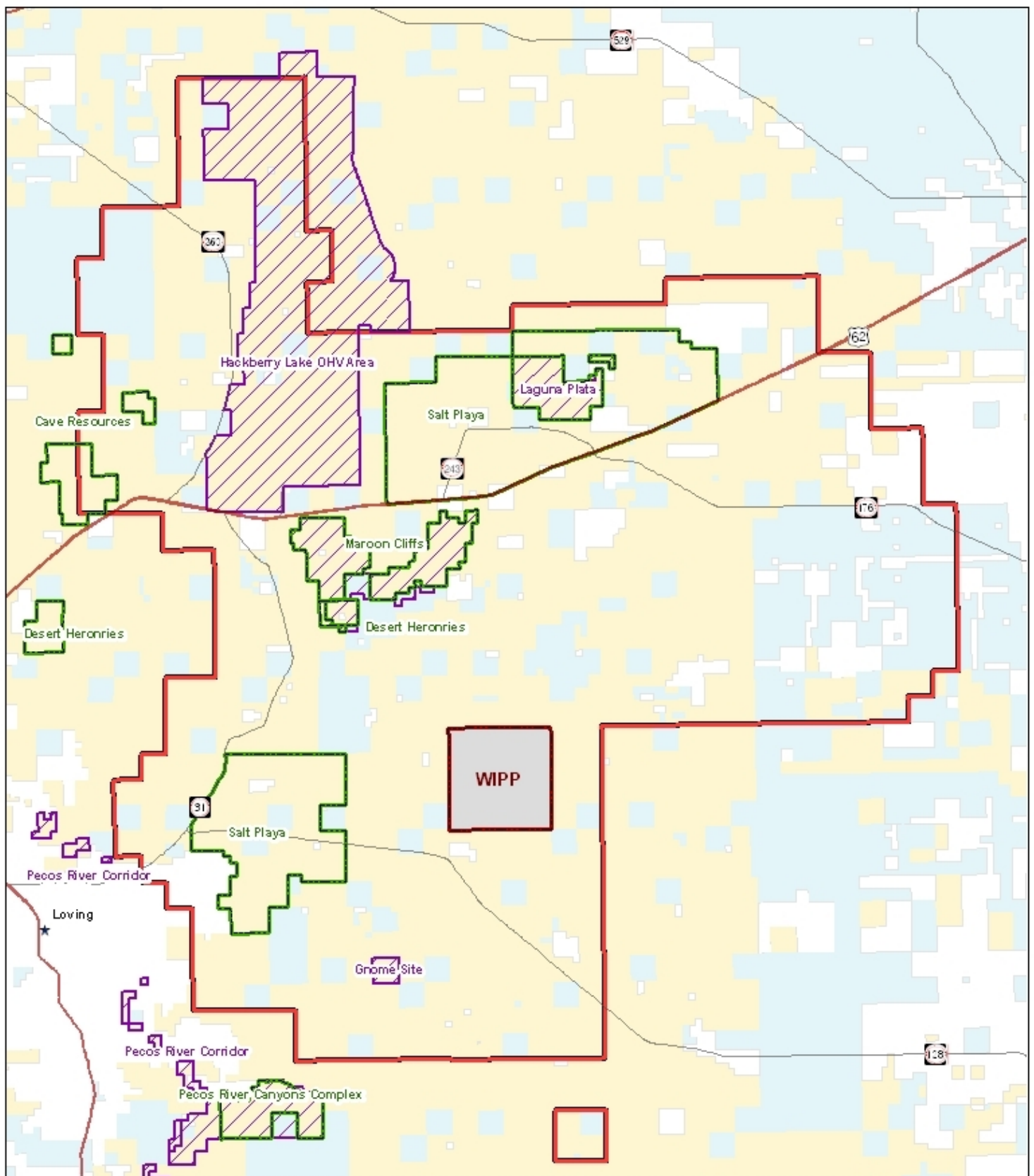


Fig.2

# *Secretary's Potash Area Potential ACECs and Other Designations*

1:320,000

0 2.5 5 10 Miles

- WIPP WIPP
- 1986 Secretary's Potash Area 1986 Secretary's Potash Area
- RMP Proposed ACECs RMP Proposed ACECs
- Special Management Areas Special Management Areas
- BLM BLM
- Dept of Energy Dept of Energy
- Private Private
- State State



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data, or for purposes not intended by BLM. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification. Map created 05/20/12



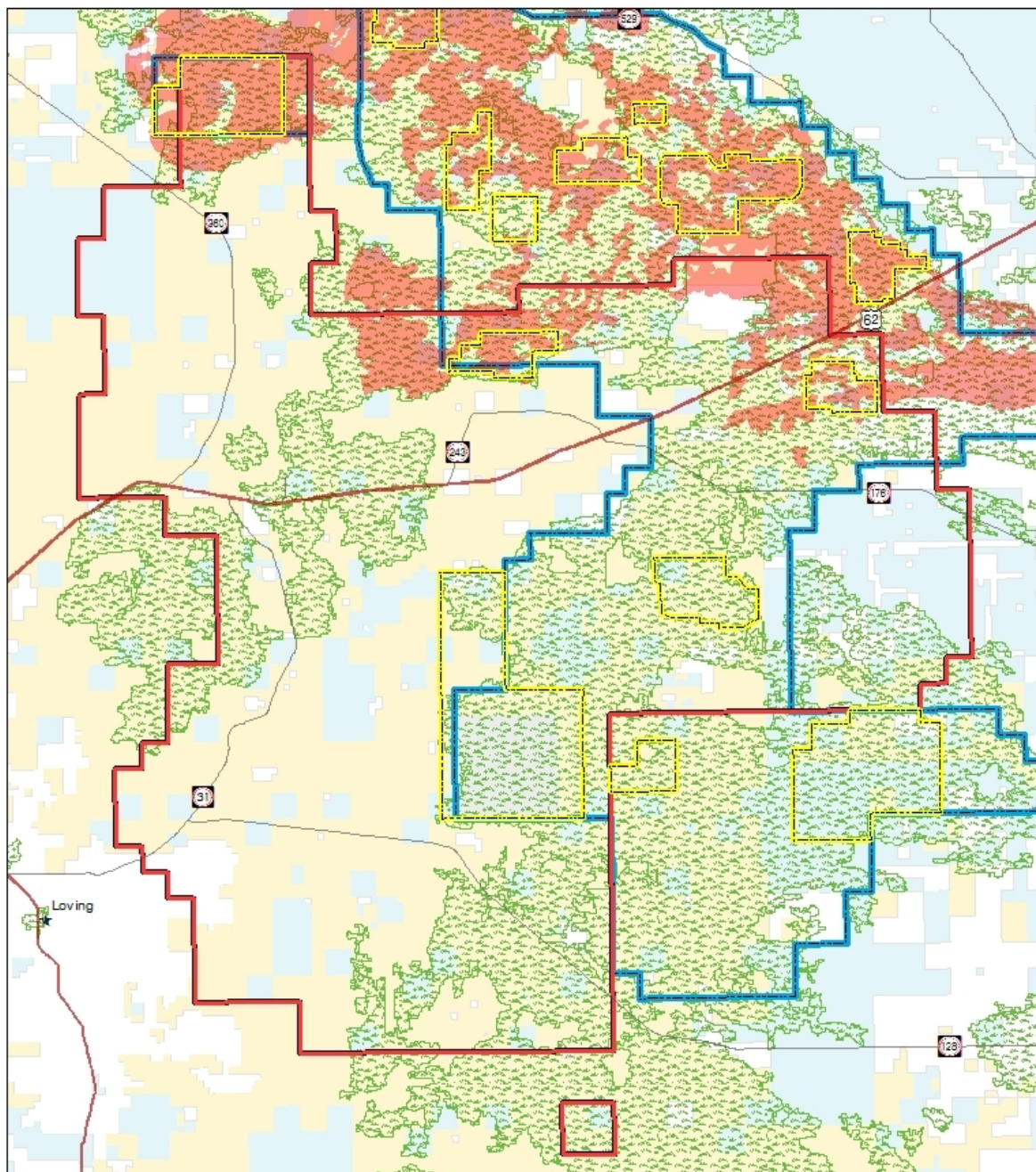


Fig.3



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data, or for purposes not intended by BLM. Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification. Map created 6/18/2012

### Secretary's Potash Area Wildlife Habitat Areas

1:320,000

0 2.5 5 10 Miles

- 1988 Secretary Potash Area
- Habitat Areas
- LPC Timing Restriction 2012
- Shrimpy Oak (LPC Habitat)
- Sand Dune Lizard Habitat
- Surface Ownership
- BLM
- Dept. of Energy
- Private
- State

## ***Direct and Indirect Impacts***

The White House's Council on Environmental Quality (CEQ) implementing regulations for NEPA define *direct effects* as "those effects which are caused by the action and occur at the same time and place." 40 CFR 1508.8(a). The regulations define indirect effects as those effects "which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems." 40 CFR 1508.8(b). The following discussion identifies the direct and indirect effects that could result from immediate implementation of the proposed change to the 1986 Secretary's Potash Order.

### ***a) Direct and Indirect Effects of Alternative A – Maintain the 1986 Secretary's Potash Order (No Action)***

Under the No Action Alternative, all new concepts and provisions contained in the proposed changes to the 1986 Secretary's Potash Order would not be implemented. Existing stipulations that allow for concurrent development of both oil and gas and potash would continue to be implemented. Specific on-the-ground actions (APDs and associated infrastructure) would be approved on a case-by-case basis in accordance with the provisions of the 1986 Secretary's Potash Order. Any benefits to the environment afforded by the proposed revision of the 1986 Secretary's Potash Order such as unitization and creation of Development Areas and Drilling Islands that could serve to consolidate surface disturbing actions would not be realized. Conversely, any potential harmful effects on the environment from the possibility of more oil and gas development or more core hole drilling occurring under the revised Order would not take place.

### ***b) Direct and Indirect Effects of the Proposed Action***

The overall environmental effect of the proposed revision of the 1986 Secretary's Potash Order would be the concentration of surface activities within designated Development Areas/Drilling Islands. While the intensity of surface use in these Drilling Islands would be more than would be associated with an individual well pad or typical lease operation, there are several environmental benefits that could be realized through concentrating efforts in certain areas such as a decrease in habitat fragmentation and opportunities for centralized facilities. In addition, the focus on unitization and development of units primarily through horizontal drilling could ultimately reduce the number of oil and gas surface locations within the DPA, as well as the number of subsurface penetrations of the potash ore zones. Development Areas/Drilling Islands would be established with close consideration of the impacts to surface resources associated with such locations. Mitigation necessary for these surface activities could include archaeological data recovery and salvage, and/or offsite mitigation, lesser prairie-chicken timing restrictions, and other forms of mitigation as appropriate. The following bulleted items describe how each new surface impacting portion of the proposed revision of the 1986 Secretary's Potash Order might impact the environment and, when those effects could be negative, how those impacts could be mitigated:



- Proposed Section 6.e.(1) would establish three exceptions to the policy to deny most proposed oil and gas wells within the DPA. Under the current Order, BLM denies most proposed oil and gas wells in potash enclaves in the DPA, with two exceptions: – (1) drilling from an area barren of potash, or (2) when the oil and gas reserves cannot be reached by drilling from a barren area or from outside the enclave, drilling may be permitted from a drilling island within the potash enclave. The revised Order would establish the following exceptions: (1) drilling could occur from a Drilling Island associated with a Development Area established under the revised Order or from a Drilling Island established under the 1986 Order; (2) drilling could occur from a Barren Area; or (3) drilling could occur from a Drilling Island or single well site established by the Authorized Officer. This revision might result in an increase in the number of established Drilling Islands within the DPA. In order to mitigate the surface impacts of these Drilling Islands, Development Areas and corresponding Drilling Islands would be established taking into account not only oil and gas and potash resources but also all other relevant factors, which would include close consideration and environmental review of the impacts to surface resources associated with such locations. Mitigation of impacts to surface water, soils, range allotments, cultural sites, and wildlife habitat impacts could include data recovery and salvage of archaeological sites, timing restrictions of activities to reduce impacts to the lesser prairie-chicken, and/or offsite habitat restoration or other forms of mitigation as appropriate.
- Proposed Section 6.e.(2) would enable the BLM to establish Development Areas and associated Drilling Islands throughout the DPA to prevent undue waste of potash resources and to consider oil and gas drilling technological capabilities in order to optimize the recovery of both resources. This revision would concentrate surface activities in several Drilling Islands throughout the DPA. In order to mitigate the surface impacts from these Drilling Islands and associated infrastructure, these Drilling Islands would be located so as to avoid impacting significant surface resources to the greatest extent possible. Mitigation of impacts to cultural resources, wildlife, surface water, soils, range allotments and other surface resources could include archaeological data recovery and salvage, timing restrictions to reduce impacts to the lesser prairie-chicken, offsite restoration/reclamation and other forms of mitigation as appropriate.
- Proposed Section 6.e.(3) would establish Buffer Zones of ¼ mile from oil wells and ½ mile from gas wells. This revision is substantially similar to the current standard operating procedure utilized by the BLM and would not create any additional surface impacts.
- Proposed Section 6.e.(4) would assert a policy preference whereby oil and gas leases within the DPA would be unitized or subject to a communitization agreement. This could result in surface impacts being confined to designated Drilling Islands and might encourage centrally located tank batteries, pipelines, frac ponds, and water disposal wells within the various Development Areas. This could have the effect of reducing the total surface disturbance, since all wells and facilities within a unit would be operated by a single entity – the unit operator. This could free small leaseholders from the requirement to drill a well on each lease (no matter how marginally productive) simply to hold onto the lease.

- Proposed Section 6.e.(5) would provide that the BLM would coordinate with the New Mexico Oil Conservation Division (NMOCD) on well spacing requirements and communitization agreements. Close coordination with the NMOCD on oil and gas activity could reduce the number of wells drilled and facilities required, and could assist in the reduction of surface disturbance and habitat fragmentation.
- Proposed Section 6.e.(6) would provide for BLM's potential approval of potash exploration. This section would enable oil and gas companies as well as potash mining companies to drill core holes to determine the existence and extent of mineable potash reserves within the DPA in order to better establish barren areas as well as areas of potash reserves. This provision might have the effect of an overall increase in the number and distribution of potash core holes drilled within the DPA. Surface impacts associated with potash core holes usually include drilling pads as well as access roads. These drill pads and access roads might have impacts, such as surface disturbance and habitat fragmentation. Impacts could be mitigated through avoidance of critical surface resources (archaeological sites, playas, sensitive wildlife habitat etc.), restoration efforts, and/or reclamation and other offsite mitigation.
- Proposed Section 6.e.(7) would require applicants for APDs, Development Areas, and Drilling Islands to provide notice to potash lessees and operators in the DPA and to oil and gas rights and surface owners who would be affected. This change should have no environmental impacts.
- All other proposed changes to the 1986 Secretary's Potash Order are exclusively administrative in nature and should have no effect on the human environment of the DPA.

Overall, BLM expects that the proposed revision to the 1986 Secretary's Potash Order would be beneficial to the environment by potentially improving the coordination of development between the extraction of oil and gas and potash and the related environmental impacts of development. However, at the present time those environmental impacts remain speculative in the absence of specific on-the-ground proposals implementing the proposed revisions to the Order.

### ***Socioeconomic Effects***

There are several complexities to consider when examining the potential socioeconomic effects of the 1986 Secretary's Potash Order revision. Changes to current operations within the known potash reserves (the potash enclave) would be different than changes to operations within the DPA but outside of the current potash enclave. The focus on Development Areas and Drilling Islands would have differential impacts on oil and gas operators depending on the specific location of the proposed Drilling Islands and proximity to specific leases. In addition, differences among various oil and gas lease holders in terms of their drilling and development strategies, their financial assets, and their technological capabilities could have differential economic effects on different operators.

The proposed revision to the Secretary's Potash Order seeks to establish Development Areas and Drilling Islands throughout the entire DPA – not just the area of known potash reserves (the potash enclave). Currently, potash resources are given priority within this enclave, except where producing wells or infill already exists, while oil and gas production has an advantage outside of

the enclave. This approach under the revised Order would seek to optimize recovery of both resources.

#### *Within the Potash Enclave*

The potash industry has the potential to be negatively affected within the enclave area in that oil and gas drilling areas may be established within areas of known potash in order to fully develop the oil and gas leases beneath potash reserves and mine workings. In this regard, oil and gas leasees within the enclave might benefit economically because they might have the ability to develop assets that had been inaccessible due to known potash reserves and had therefore been held in suspension. While oil and gas operators might be able to access these resources, in most cases it would require that zones be developed through horizontal drilling and hydraulic fracturing. In general, this methodology is a more efficient method of developing the Delaware and Bone Springs Formations (more complete extraction of the resource, less surface disturbance, consolidated infrastructure). However, the cost of a horizontal well is significantly more than a conventional vertical well (up to four times as much). This could create difficulties for some smaller operators who might not have the financial or technological means to support horizontal drilling to reach their leases. In addition, specialized drill rig and hydraulic fracturing equipment availability is limited. Smaller operators might not have the financial ability to contract this equipment for a single well or lease if the drill rigs and fracing crews had longer term commitments to larger oil and gas companies.

#### *Outside of the Potash Enclave*

The proposed revision would require the establishment of Development Areas and Drilling Islands in areas outside of the enclave but within the DPA. Currently, oil and gas operations in this zone are permitted as long as they do not impact known potash reserves (although operators are encouraged to plan development so as not to cut off future potash reserves from current mine workings). Under the proposed revision, future oil and gas development in this area would be restricted to Development Areas and Drill Islands in order to ensure orderly oil and gas development that would not impact future potash mining operations. Oil and gas development would not be prohibited in this area, but it would be limited in the manner in which it could occur. The potash industry would benefit from the proposed revision in this area because potash deposits in the region would not have oil and gas development cut off their access to areas of future mining.

#### *Potential for Different Impacts on Small and Large Oil and Gas Operators*

One of the potential economic impacts of the proposed revision would be a differential impact on certain oil and gas operators based upon their economic capabilities, lease size, and the drilling and development opportunities they have available. With the changes in the proposed order revision, individual operators might not be able to develop their leases in their preferred method. However, they would have opportunities to develop their resources within the constraints of the order and to participate in unit agreements. Economic impacts on individual companies would be situationally specific based upon the size of the Development Area and proximity of Drilling Islands to their individual leases. While the BLM receives copies of unit operating agreements, the BLM is not a party to these agreements among companies. Based upon individual circumstances, some operators might benefit from these agreements while others might not.

### *Overall Economic Impacts*

The overall end result of the proposed revision to the Secretary's Potash Order is that more areas within the DPA would be made available for oil and gas extraction while protecting potash reserves and open mine workings throughout the DPA. Development Areas and Drilling Islands would be established to more efficiently extract oil and gas resources. Over 90% of the Delaware and Bone Springs oil and gas wells in southeastern New Mexico are now being developed through horizontal drilling and hydraulic fracturing. Horizontal development has become the *defacto* industry standard and in general is perceived as a superior method of oil and gas development in unconventional reservoirs. This should result in higher extraction rates of petroleum resources and an overall increase in economic benefits to the oil and gas industry as a whole. An increase in subsequent royalty payments to the state of New Mexico and the Federal Treasury could also be expected. The potash industry would continue to benefit from the protections afforded by the Secretary's Potash Area designation. The Development Area and Drilling Island concept would protect access to potash resources for areas of future mining efforts. This will ensure availability of this unique resource that is so vital to our domestic food supply. While BLM expects that the proposed revision would benefit the overall economic outlook for both industries, the exact economic effects and impacts specific to certain companies remains unknown.

### *c) Cumulative Impact*

The CEQ regulations define cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." 40 CFR 1508.7.

A variety of activities that affect the human environment already occur on public lands within the DPA. In addition to oil and gas development and potash mining other activities include recreation, livestock grazing, saleable mineral (caliche, gravel, sand, etc.) extraction, hunting, rights-of-way, and waste disposal and site protection conducted through the Department of Energy. Consideration of the cumulative impacts within the DPA must consider impacts in combination with these other ongoing activities.

Existing operational and historic potash mining operations within the DPA have contributed to considerable surface impacts in the areas where shafts and processing facilities are located. Mine tailings as well as operational infrastructure (buildings and processing facilities, roads, railroad spurs, settling ponds, core hole locations, etc.) and other activities are evident in portions of the DPA. Intrepid Potash's newly permitted HB Solution Mine will add approximately 600 acres of solar evaporation ponds as part of the potash recovery operation. In addition, a new polyhalite mine, the Ochoa Mine, has been proposed by Intercontinental Potash Corporation in an area immediately southeast of the DPA.

In keeping with the 1986 Secretary's Potash Order's focus on concurrent development, there are already a large number of existing oil and gas wells (almost 5,000) within the DPA. This revision would not open areas to drilling that were identified in the RMP as lands closed to oil

and gas leasing. It is likely that the proposed revision's focus on orderly development as proposed by the creation of Development Areas, a focus on unitization, and the establishment of Drilling Islands could serve as a means of consolidating oil and gas development in the DPA.

Unitization could serve as a means of lowering the overall number of wells drilled, as it would be possible to extend all leases within a unit beyond the initial term with a single producing well. This could deter companies from drilling a well in order to extend a lease beyond the initial term in areas that may have less than optimal production potential.

The establishment of Development Areas and associated Drilling Islands could serve to consolidate oil and gas activity in specific areas within the DPA. Currently producing wells outside of the Development Areas and Drilling Islands would eventually be abandoned. This could lead to opportunities for consolidated and more orderly infrastructure development. This consolidation could take the form of centralized frac ponds, consolidated tank batteries, more orderly pipeline and road development and centralized produced water disposal wells. Over time, the result could be a reduction in scattered or dispersed wells throughout the DPA.

Consolidating activities in Drilling Islands could reduce habitat fragmentation and reduce impacts to potash resources by preventing undue waste and by reducing the areas requiring safety Buffer Zones for mining activities. Surface impacts in these specific Drilling Islands might be more intensive than would be required for a larger number of more dispersed wells. However, the overall surface disturbance acreage and habitat fragmentation impacts should be considerably less by utilizing the Development Area/Drilling Island concept. Drilling Island locations would have to be carefully located to minimize impacts to surface resources. Mitigation of surface impacts in Drilling Island areas could require data recovery of archaeological sites and offsite mitigation of wildlife and other resource impacts. While such impacts are currently speculative, it is possible that strict avoidance of archaeological sites and wildlife resources might not be a viable mitigation alternative.

In summary, the creation of Development Areas and Drilling Islands throughout the DPA could allow more orderly development of oil and gas resources within the area. It is possible that a net total of more wells might be drilled in the area due to the new concepts in the proposed revision to the 1986 Secretary's Potash Order than would otherwise have been drilled. However, depending on the number and size of units that might be established along with subsequent Development Areas/Drilling Islands, there could be a decrease in the number of wells drilled. This would be due to the fact that small leaseholders could be included in the communitization or unit agreements and might not find it necessary to drill a well in a marginal lease just to extend the lease beyond the initial term to retain it as a corporate asset. Unitization and Drilling Islands might also encourage horizontal drilling, which might reduce the overall number of surface locations, although the pad size and infrastructure required, such as frac ponds, could somewhat offset the total reduction in surface disturbance. Resources that could benefit from this proposed revision of the Order would primarily be water resources, soils, and wildlife. The proposed revised Order is expected to focus activities in certain Drilling Islands instead of having activities dispersed across the landscape. Benefits to these resources would likely be gained through a decrease in overall habitat fragmentation.

The cumulative impacts associated with the proposed action would appear to be positive, but not substantial. Coordination with the State of New Mexico (both the Department of State Lands and the New Mexico Oil Conservation Division) would be necessary to ensure that actions on State and Federal surface are in concert with regard to efficient concurrent development of potash and oil and gas resources. Overall, we expect that the cumulative impacts from the revision of the 1986 Secretary's Potash Order would benefit the human environment within the DPA because of the consolidation of surface activities and better coordination between the oil and gas and potash industries.

## ***VII. Tribes, Individuals, Organizations, or Agencies Consulted***

### ***a) Tribes Engaged***

Under the President's memorandum of April 29, 1994, "Government-to-Government Relations with Native American Tribal Governments" (59 FR 22951) and 512 Departmental Manual 2, the BLM evaluated possible effects of the proposed revision of the 1986 Secretary's Potash Order on federally recognized Indian tribes. The BLM CFO consults with seven federally recognized tribes with tribal interests within the DPA. Consultation was conducted throughout June, July and August of 2012. Initial contact with tribes was made in the form of a formal letter informing them of the proposed revision and soliciting their concerns and input. This letter included a map showing the location of the DPA.

<b><i>Tribe/Pueblo: Point Of Contact</i></b>	<b><i>Date of BLM Letter</i></b>	<b><i>Response Received</i></b>	<b><i>Concerns/Issues</i></b>
Mescalero Apache Tribe: President Mark Chino	June 8, 2012	No written response received	N/A
Ysleta del Sur Pueblo: Frank Paiz	June 8, 2012	No written response received	N/A
Pueblo of Isleta: Governor Frank Lujan	June 8, 2012	June 14, 2012	No specific concerns
Apache Tribe of Oklahoma: Chairman Donnie Cabaniss	June 8, 2012	No written response received	N/A
Comanche Nation Chairman Johnny Wauqua	June 8, 2012	No written response received	N/A
Kiowa Tribe of Oklahoma: Chairman Ron Twohatchet	June 8, 2012	No written response received	N/A
Hopi Tribe: Chairman Leroy Ned Shingoitewa	June 8, 2012	No written response received	N/A

A second letter (email and hard copy) that included a copy of the draft revision to the 1986 Secretary's Potash Order was sent to the tribes on July 9, 2012.

A series of face-to-face meetings were held during the months of July and August 2012 with the various tribes. These meetings were arranged in order to discuss the proposed revision of the 1986 Secretary's Potash Order as well as the Carlsbad RMP Revision and other projects and initiatives within the BLM CFO. These meetings took place at the various tribal/pueblo locations and were designed to provide an opportunity for the BLM to collect information from the tribes regarding their concerns or issues associated with these projects. The following meetings were held:

<b><i>Tribes/Pueblo:</i></b>	<b><i>Date and Location of Meeting</i></b>	<b><i>BLM Attendees</i></b>	<b><i>Tribal Attendees</i></b>
Mescalero Apache Tribe	July 20, 2012	Jim Stovall, BLM CFO Manager, George MacDonell, BLM CFO Assoc. Manager, James Smith, BLM CFO Lead Archaeologist	Holly Houghton, Mescalero THPO; Arden Comanche, Cultural Advisor
Ysleta del Sur Pueblo	July 24, 2012	Jim Stovall, BLM CFO Manager, George MacDonell, BLM CFO Assoc. Manager, James Smith, BLM CFO Lead Archaeologist	Javier Loera, War Captain/THPO
Pueblo of Isleta:	July 25, 2012	Jim Stovall, BLM CFO Manager, George MacDonell, BLM CFO Assoc. Manager, James Smith, BLM CFO Lead Archaeologist	Governor Frank Lujan; 11 members of the Isleta Cultural Committee;
Apache Tribe of Oklahoma	July 16, 2012	Jim Stovall, BLM CFO Manager, George MacDonell, BLM CFO Assoc. Manager, James Smith, BLM CFO Lead Archaeologist	Chairman Donnie Donald Cabaniss, Jr; and 3 members of the Tribal Council
Comanche Indian Tribe	July 18 , 2012	Jim Stovall, BLM CFO Manager, George MacDonell, BLM CFO Assoc. Manager, James Smith, BLM CFO Lead Archaeologist	Jimmy Arterberry, THPO/NAGPRA Director

Kiowa Tribe of Oklahoma	July 17, 2012	Jim Stovall, BLM CFO Manager, George MacDonell, BLM CFO Assoc. Manager, James Smith, BLM CFO Lead Archaeologist	Chairman Ron Twohatchet
Hopi Tribe	August 2, 2012	Jim Stovall, BLM CFO Manager, George MacDonell, BLM CFO Assoc. Manager, James Smith, BLM CFO Lead Archaeologist	Leigh J. Kuwanwisiwma, Director Cultural Preservation Office; Terry Morgart, THPO

All of the tribes expressed the concern that any activities to be conducted under the Order comply with the requirements of the Native American Graves Protection and Repatriation Act (NAGPRA), 25 U.S.C. 3001-3013. The tribes further urged that they be provided with immediate notification of any human remains and associated funerary items inadvertently discovered during the course of such activities. In the course of the tribal consultations, the tribes did not identify any specific areas of traditional cultural importance within the Designated Potash Area. However, the Mescalero and Comanche Tribes both indicated that they could not answer because they had not been to the area.

***b) USFWS Consultation***

The BLM consulted informally with the U.S. Fish and Wildlife Service (USFWS) under section 7 of the Endangered Species Act of 1973, as amended. The BLM prepared a letter detailing the administrative nature of the proposed revision of the Secretary's Potash Order. After review, the USFWS supported the BLM's determination of "no effect" for the two candidate species.

***c) Individuals Consulted***

This section includes individuals or organizations from the public, external agencies, and the interdisciplinary team that were contacted during the development of this document.

<b>ID Team Member/ Contact Name</b>	<b>Title</b>	<b>Organization</b>
Phil Allard	Special Assistant – Office of the Director	BLM-WO
Paul McNutt	Economist – Division of Solid Minerals	BLM-WO
Ian Senio	Division Chief – Division of Regulatory Affairs	BLM-WO



Sue Umshler	Attorney	DOI – Office of the Solicitor
John Smitherman	Co-Chairman, Joint Industry Technical Committee	BOPCO, L.P.
John Mansanti	Co-Chairman, Joint Industry Technical Committee	Intrepid Potash, Inc.
Kevin Ryan	Joint Industry Technical Committee	Intrepid Potash, Inc.
Suzanne P. Holland	Joint Industry Technical Committee	Chevron, U.S.A.
Judy L. Moses	Joint Industry Technical Committee	Chevron, U.S.A.
Chad Johnson	Joint Industry Technical Committee	Cimarex Energy Company
Stephen P. Bell	Joint Industry Technical Committee	Cimarex Energy Company
J. Robert Ready	Joint Industry Technical Committee	COG Operating LLC
David Harms	Joint Industry Technical Committee	ConocoPhillips
William H. Boyer	Joint Industry Technical Committee	Mosaic Potash
Daniel J. Morehouse	Joint Industry Technical Committee	Mosaic Potash
John A. Merson, Ph.D.	Joint Industry Technical Committee	Sandia National Laboratories
Michael Wichterich	Joint Industry Technical Committee	Three Rivers Operating Company LLC
Tim Kane	Joint Industry Technical Committee	Three Rivers Operating Company LLC
James S. Brown	Joint Industry Technical Committee	Yates Petroleum Corporation
Steve Daly	Soil Conservationist	BLM-CFO

Legion Brumley	Environmental Protection Specialist	BLM-CFO
Todd Suter	Realty Specialist	BLM-CFO
Owen Lofton	Carlsbad RMP Program Lead	BLM-CFO
Tanner Nygren	Natural Resource Specialist	BLM-CFO
Mark Lewis	Geologist	BLM-CFO
John Fast	Natural Resource Specialist	BLM-CFO
Jim Renn	Archaeologist	BLM-CFO
Robert Gomez	Realty Specialist	BLM-CFO
Jeanette Martinez	Assistant Field Manager - Resources	BLM-CFO
Wesley Ingram	Supervisory Petroleum Engineer	BLM-CFO
Aaron Stockton	Natural Resource Specialist/Cave/Karst	BLM-CFO
Deanna Younger	Recreation Specialist	BLM-CFO
James B. Smith	Lead Archaeologist	BLM-CFO
Cody Layton	Natural Resources Specialist	BLM-CFO
John A. Chopp	Wildlife Biologist	BLM-CFO
Calvin Deal	Rangeland Management Specialist	BLM-CFO
Bob Ballard	Wildlife Biologist	BLM-CFO
Craig Cranston	Mining Engineer, Solid Minerals	BLM-CFO
Ty Allen	Fish and Wildlife Service	USFWS-CFO
George MacDonell	Associate Field Manager	BLM-CFO
Jim Stovall	Field Manager	BLM-CFO
Tony Herrell	Deputy State Director - Minerals	BLM NMSO
Marikay Ramsey	T & E Lead	BLM NMSO
Signa Larralde	Cultural Resources Lead	BLM NMSO

Rebecca Hunt	Natural Resource Specialist	BLM NMSO
Jay Spielman	Geologist	BLM NMSO
Frank Lujan	Governor	Pueblo of Isleta
Mark Chino	President	Mescalero Apache
Holly Houghton	THPO	Mescalero Apache
Arden Comanche	Cultural Advisor	Mescalero Apache
Donnie Cabaniss	Tribal Administrator	Apache Tribe of Oklahoma
Johnny Wauqua	Chairman	Comanche Nation
Jimmy Arterberry	THPO/NAGPRA Director	Comanche Nation
Ron Twohatchet	Chairman	Kiowa Tribe of Oklahoma
Leroy Ned Shingoitewa	Chairman	Hopi Tribal Council
Terry Morgart	THPO	Hopi Tribe
Leigh J. Kuwanwisiwma	Director Cultural Preservation Office	Hopi Tribe
Frank Paiz	Governor	Ysleta del Sur Pueblo
Javier Loera	War Captain/THPO	Ysleta del Sur Pueblo

## ***VIII. List of Preparers***

This assessment was prepared by George MacDonell, Carlsbad Field Office, Associate Field Office Manager; Craig Cranston, Carlsbad Field Office, Lead Mining Engineer; James Smith Carlsbad Field Office, Lead Archaeologist; and Rebecca Hunt, New Mexico State Office, Natural Resources Specialist.